

**Remarks**

Claims 1-20 stand rejected. Claims 2, 3, 12 and 13 are canceled; thus claims 1, 4-11 and 14-20 remain pending. Claims 1, 4-6, 8, 11, 14-16 and 18 are amended herein. The Assignee respectfully requests reconsideration of the rejections and requests allowance of claims 1, 4-11 and 14-20.

**Information Disclosure Statement**

The Office action indicates that citation #1 of the Information Disclosure Statement (IDS) filed January 13, 2005, "has been lined through because the US PG Publication No. appears to be incorrect." After review of the IDS, the Practitioner has determined that the number for the Patent Application Publication originally submitted (2002/010996 A1) was indeed incorrect due to a typographical error. In response, submitted herewith is a new IDS disclosing the correct number (2002/0109906 A1) under 37 C.F.R. § 1.97(c), since the first Office action has already been issued for the present application. As a result, the Office is hereby authorized to charge the requisite fee under 37 C.F.R. § 1.17(p) of \$180.00.

**Specification Amendments**

The paragraph beginning at page 2, line 19, is amended herein to modify references of "Raman Stokes" to "Raman Stokes shift" to more closely align the terminology of the present application with nomenclature more commonly employed in the art. As the meaning of the previously-used term is clear from the remainder of the paragraph, no new matter has been added as a result of the amendment.

**Claim Amendments**

Independent communication system claim 1 is amended to include the provisions of claims 2 and 3. More specifically, claim 1 now provides three fiber spans, two pump systems, and two splitters. The first pump system generates a first light beam, which is split into first and second portions by the first splitter. The second pump system and second splitter operate in a corresponding manner. The first splitter is configured to backward propagate the first portion of the first beam over the first span and forward

propagate the second portion of the first beam over the second span. Similarly, the second splitter is configured to backward propagate the first portion of the second beam over the second span and forward propagate the second portion of the second beam over the third span. Claim 1 also is amended to indicate that the powers of the first and second portions of the first beam are not equal, as are the powers of the first and second portions of the second beam. Independent method claim 11 includes similar limitations, some of which have been promoted from dependent claims 12 and 13. These provisions are supported in the portion of the specification concerning the embodiment disclosed in Fig. 3, and described at page 8, line 15, to page 11, line 9. In that embodiment, each of a first and second beams is split into first and second portions having a power of 269.2 mW and 260 mW, respectively.

As the provisions of claims 2, 3, 12 and 13 have been promoted into their corresponding independent claims, these claims are canceled.

Dependent claims 4-6 and 14-16 are amended to alter their dependency to claims 1 and 11, as necessary in light of the cancellation of claims 2, 3, 12 and 13.

Dependent claims 8 and 18 are amended to remove the portion of the range wherein the portions of the first light beam are substantially equal, in accordance with the provisions of their independent claims as amended herein.

#### Claim Rejection Under 35 U.S.C. § 102

Claims 1-4 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,344,922 to Grubb et al. (hereinafter "Grubb"). (Page 2 of the Office action.) The Assignee respectfully traverses the rejection in light of the current amendments to claims 1 and 11, and in view of the following discussion.

More specifically, the Office action employs the system presented in Fig. 5(a) of Grubb in the rejection of claims 1-4 and 11-14. (Pages 2 and 3 of the Office action.) However, only a single mention of the "signal distributors 24" is made in Grubb. (Column 6, lines 27 and 28.) No discussion is provided as to the nature of the distributors, including whether the distributors evenly distribute the light received from the combiners 26. Thus, Grubb does not teach or suggest the first and second portions of each light beam being unequal, as provided for in claims 1 and 11. As a result, the

Assignee contends that claims 1 and 11 are allowable in view of Grubb, and such indication is respectfully requested.

Also, claim 4 depends from independent claim 1, and claim 14 depends from independent claim 11, thus incorporating the provisions of their respective independent claims. Thus, the Assignee asserts claims 4 and 14 are allowable for at least the reasons provided above in support of claims 1 and 11, and such indication is respectfully requested.

Claims 2, 3, 12 and 13 are canceled here. Thus, the rejection as it pertains to those claims is rendered moot.

Therefore, in light of the foregoing, the Assignee respectfully requests withdrawal of the 35 U.S.C. § 102 rejection of claims 1-4 and 11-14.

#### Claim Rejections Under 35 U.S.C. § 103

Claims 5, 6, 8, 15, 16 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grubb in view of U.S. Patent No. 6,603,593 to Fidric et al. (hereinafter "Fidric"). (Page 4 of the Office action.) Also, claims 7, 9, 10, 17, 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Grubb in view of "Fiber-Optic Communication Systems" by Agrawal (hereinafter "Agrawal"). (Page 5 of the Office action.) The Assignee respectfully traverses the rejection in light of the amendments to claims 1 and 11, and in view of the following discussion.

The Office action states, "With respect to claims 6, 8, 15, and 18, Grubb does not specifically disclose that the splitter is a 3dB splitter. However, Fidric teaches the use of a 3dB splitter (#20). It is well-known in the art that a 3dB splitter is so named because an equal division (50/50) of an input signal between two output ports causes a 3 dB loss." (Page 4 of the Office action.) However, neither Fidric nor Grubb mention providing *unequal* powers between first and second portions of a light beam from a splitter, as employed in claims 1 and 11.

Also, neither Fidric nor Grubb provide any motivation for providing such unequal powers. The present application indicates that "lower local pump power may be safer for the operators of communication system 300 while still providing the desired gain. The chances of burns or fires may be significantly reduced." (Page 11, lines 4-6.) Also,

"Raman gain by forward pumping also advantageously reduces noise accumulation. The OSNR (optical signal-to-noise ratio) may be 6 dB with 0.5 dB resolution bandwidth. The reduced noise may improve transmission performance." (Page 11, lines 7-9.) Thus, the amount of reduced noise accumulation due to forward propagation, balanced with a desire to reduce the probability of burns or fires by splitting the optical power of the pump, provides at least one basis by which the relative unequal powers of the first and second portions of each beam of claims 1 and 11 may be determined. In the context of claims 1 and 11, these unequal powers are related to the percentage of forward versus backward pumping of the second fiber span. Neither Grubb nor Fidric describe such a motivation, or any other, for providing unequal powers.

Thus, on the basis of the foregoing, the Assignee respectfully asserts that independent claims 1 and 11 are allowable in view of any combination of Grubb and Fidric. Also, claims 5-10 depend from independent claim 1, and claims 15-20 depend from independent claim 11, thus incorporating the provisions of their associated independent claims. Thus, the Assignee contends that claims 5-10 and 15-20 are allowable in light of the current amendments to claim 1 and 11. Therefore, the Assignee respectfully requests withdrawal of the rejections of claims 5-10 and 15-20.

#### Conclusion

Based upon the above remarks, the Assignee submits that claims 1, 4-11 and 14-20 are allowable. Additional reasons in support of patentability may exist, but such reasons are omitted in the interest of clarity and brevity. The Assignee thus respectfully requests allowance of claims 1, 4-11 and 14-20.

The Assignee believes no additional fees are due with respect to this filing beyond the fee for the current IDS, authorized above. However, should the Office determine additional fees are necessary, the Office is hereby authorized to charge Deposit Account No. 21-0765 accordingly.

Respectfully submitted,

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